

## **SECTION 403**

### **RECLAIMED PAVEMENT FOR BASE COURSE AND/OR SUBBASE**

#### **DESCRIPTION**

##### **403.20 General.**

The work shall consist of producing a stabilized base course and/or sub-base through the recycling of the existing pavement structure and a specified depth of acceptable sub-base material.

This combination of pavement and sub-base material is to be uniformly crushed, pulverized and blended, then spread, graded, and compacted to the lines and grades shown on the plans or established by the Engineer.

#### **MATERIALS**

##### **403.40 General.**

All reclaimed material shall conform to the requirements of Subsection M1.11.0 of Division III, Materials.

Aggregate for Crushed Stone for Blending, used to correct gradation deficiencies shall conform to the requirements of Subsections M2.01.0 to M2.01.6 of Division III, Materials.

Aggregate for Dense Graded Crushed Stone for Sub-base shall conform to the requirements of Subsection M2.01.7 of Division III, Materials.

##### **403.41 Sampling and Pretesting.**

The Department will take and analyze test pits to the depth to be recycled and provide the following information in the bid proposal for each:

1. The location of the test pit.
2. The depth of existing bituminous material to be recycled.
3. The aggregate gradation of the underlying material to be recycled.

The information supplied is intended to be an indication of the existing conditions and in no way releases the Contractor from the responsibility of fulfilling the requirements of this specification.

Any gradation deficiencies in the existing materials, as indicated by the test pits, shall be corrected by blending the appropriate aggregate size(s) into the mixture.

#### **CONSTRUCTION METHODS**

##### **403.60 General.**

Reclaiming operations shall not be permitted when the existing pavement or sub-base contains frost, when the sub-base is excessively wet as determined by the Engineer, nor when the air or surface temperature is below 5 °C.

Reclaiming operations shall not commence before April 15 and shall terminate on or before October 15 unless otherwise approved in writing by the Engineer.

Prior to the start of reclaiming operations, the Contractor shall locate and protect existing drainage and utility structures and underground pipes, culverts, conduits and other appurtenances.

The limit of each sequence of the reclamation process shall be 1.6 kilometers full width or as directed by the Engineer in order that the placing of pavement structure, up to the binder course, will be completed before beginning the next sequence of roadway reclamation work.

##### **403.61 Equipment.**

The recycling equipment shall have a positive depth control to insure a uniform depth of processing. This equipment shall have the ability to process the complete design depth specified into a homogeneous mass. It shall also be capable of crushing all oversize material encountered except ledge, or boulders larger than 200 millimeters in diameter.

A minimum of fourteen (14) calendar days prior to the proposed start of work, the Contractor shall submit in writing to the Engineer for approval, a description of the specific equipment and construction methods to be used in performing the work. The Contractor will be required to demonstrate, to the Engineer, the ability of the work crew and equipment to produce reclaimed material conforming to specifications at a rate of production consistent with the time allowed under the Contract. A test section shall be constructed approximately 150 meters long and one lane wide, and be located within the project limits at a location determined by the Engineer. The forward speed and processing direction (e.g., up cutting vs. down cutting) of the recycling equipment shall be recorded during construction of the test section. Representative samples of the reclaimed material shall be taken from this test section for analysis by the Engineer. Full scale production will not be allowed to commence until the Engineer has reviewed the test results and gives written approval of the equipment and construction methods used in the construction of the test strip.

Failure to meet gradation requirements or an insufficient production rate may be considered cause for rejection of the equipment, the construction methods, or both. The Contractor must then submit, in writing, the proposed changes in equipment and/or construction methods and either construct another test section or reconstruct the original section, as determined by the Engineer. This procedure may be repeated until acceptable results are obtained, at no additional compensation.

Failure to meet gradation requirements due to improper equipment or construction methods shall not constitute a reason for any additional compensation for the import and blending of any aggregate to meet the deficiencies.

Approval of equipment includes the speed and processing direction it was operated at during construction of the test section. Therefore, the same operating speed and processing direction must be maintained during normal production. Changes in the equipment's operating speed and/or processing direction may only be made with the Engineer's written approval.

At least one vibratory roller shall be used on each reclaimed surface, and shall have a compacting width of not less than 1.5 meters. Each roller shall have a gross mass of not less than 14.6 metric tons.

Approved equipment shall be maintained in satisfactory working condition at all times.

#### **403.62      Structure Lowering and Raising.**

All work shall be done in accordance with the applicable provisions of Section 220.

All drainage, utility, and municipality structures are to be referenced and lowered to a minimum depth

150 millimeters below the bottom of the proposed reclaimed base course. Lowered structures shall be covered with steel plates conforming to the requirements specified in Subsection 7.09. The voids remaining after the structures have been lowered are to be filled with a suitable material as determined by the Engineer. The Contractor will be responsible for the coordination with the respective utility companies for the lowering and raising of privately owned structures and gate boxes. The reclaiming operation shall not begin until all structures and boxes are lowered.

It shall be the Contractor's responsibility to maintain drainage functioning properly in the areas under construction up to the time when the final system is put into use. All structures lowered will be raised to the binder grade elevation upon placement of the binder course material for that section. Adjustment of the castings to final grade will not be allowed until the Engineer approves the placement of bituminous concrete top course material throughout the project.

Any drainage structure found to be deteriorated below the plated depth shall be rebuilt from the bottom of the deterioration to the plated depth.

#### **403.63      Reclaiming Operations.**

Prior to the start of reclamation, the existing pavement shall be swept with a power sweeper to remove all trash, sand, dirt, organic matter, and other undesirable material, to the satisfaction of the Engineer.

Also, the existing pavement shall be sawcut full depth within the areas where the adjacent surface is

to be protected (curb, side streets, etc.) as shown on the plans and/or as directed by the Engineer.

The Contractor shall reclaim only that area of pavement that can be processed and compacted by the end of the same working day, at which time it must be opened to traffic, with the Engineer's approval. In any section, reclamation work shall be done on one-half the road width at a time. One-way traffic will be allowed only during working hours with traffic police present. Two-way traffic shall be maintained at all other times. Suitable ramping shall be in place at the beginning and end of work zone to allow for smooth and safe travel. This shall be considered incidental to the work for this item. The required density shall be maintained until the bituminous concrete pavement has been placed. Any imperfections discovered prior to its placement shall be repaired, as directed by the Engineer, at no additional compensation.

The total thickness of the pavement structure, unless otherwise indicated, and uppermost portion of the sub-base layer shall be recycled to the design depth specified on the typical section(s). The Engineer shall perform a sieve analysis of the reclaimed material for every 4200 square meters of material processed or as often as conditions may require as determined by the Engineer. Test results shall be made available to the Contractor. If conditions warrant, the Engineer may stop work until the required test results become available. If the Engineer directs, due to gradation deficiencies in the existing materials as indicated by the test pits, the appropriate crushed stone aggregate size(s) shall be blended with the recycled material to produce a uniform mixture meeting the gradation requirements. Additionally, if the Engineer directs, dense graded crushed stone shall be added for volume purposes.

Any required modifications to the remaining sub-base such as, but not limited to, cuts, fills, and grade realignment shall be made. Existing unsuitable material shall be removed to the lines and grades established by the Engineer and replaced with a suitable material, as determined by the Engineer. Existing surplus reclaimed material shall be used, when available, at no additional compensation.

All unsuitable material and/or excess reclaimed material shall become the property of the Contractor to be properly disposed of outside the project limits.

#### **403.64      Compaction and Dust Control.**

The reclaimed material shall be rolled, compacted and fine graded to the specified cross section(s) and/or grades as shown or as established by the Engineer.

The reclaimed base course shall be tested for compaction and smoothness and accuracy of grade in accordance with the applicable provisions of Subsection 401.60. The required density shall be measured by a Nuclear Density Gauge supplied by the Department. If any portions are found to be unacceptable by the Engineer, such portions shall be reprocessed, regraded, and recomacted until the required smoothness and accuracy are obtained.

At the end of each day's progress, the Contractor shall apply Calcium Chloride in accordance with the applicable provisions of Section 440. Water for roadway dust control shall be applied as directed.

A grader, roller and water wagon shall be maintained on the project site during the reclamation process. The Contractor shall submit to the Engineer, in writing, a twenty-four (24) hour availability telephone number for any emergency maintenance dictated by the weather conditions or as determined by the Engineer, for repair, compaction, and dust control.

### **COMPENSATION**

#### **403.80      Method of Measurement.**

Reclaimed Base Course shall be measured in place, to the limits specified on the plans or as directed by the Engineer. No deductions will be made for surface structures. The lowering and the plating of gates and structures will be considered incidental to this item and no additional compensation will be allowed.

Structures raised from the plated depth to an intermediate depth of approximately 200 millimeters below finished grade, as determined by the Engineer, shall be plated and shall be measured by the unit each as a Drainage Structure Remodeled.

Structures adjusted from the intermediate depth to finished grade shall be measured by the unit each as a Drainage Structure Adjusted.

Structures rebuilt shall be measured by the average height in vertical meters and hundredths of a meter from the bottom of the deterioration to the plated depth. Structures damaged below the plated depth, due to the Contractors negligence, shall be measured and deducted from the vertical meter measurement.

Raising the structure from the plated depth will be measured as stated above for a remodeled unit.

#### **403.81 Basis of Payment.**

The accepted quantity of reclamation as measured above shall be paid for at the contract unit price bid per square meter. This unit price shall include all compensation for crushing, pulverizing, blending, spreading, grading, sawcutting the existing bituminous concrete at the direction of the Engineer, compacting, test section construction, blending with aggregate, moving the processed material to allow for modifications to the remaining sub-base and/or subgrade, moving reclaimed material from one location to another within the project and any incurred costs resulting from the Contractor's decision to process off site.

The unit price bid shall also include compensation for all costs associated with the removal of the castings and the referencing, lowering, and plating of the structures. It shall also include full compensation for all labor, tools, equipment, materials, and all incidental work necessary to complete the work as specified.

Removal and disposal of unsuitable material, surplus reclaimed material, or any sub-base/subgrade material necessary for grade changes shall be paid for at the contract unit price per cubic meter for Item 120.1, Unclassified Excavation.

Special borrow required to be placed under the reclaimed material shall be paid for at the contract unit price per cubic meter for Item 150.1, Special Borrow.

Grading and compacting the sub-base and/or subgrade resulting from the removal of unsuitable material shall be paid for at the contract unit price per square meter for Item 170., Fine Grading and Compacting - Subgrade Areas.

Adjustment of drainage structures shall be paid for at the contract unit price each for Item 220., Drainage Structure Adjusted.

Rebuilding of drainage structures shall be paid for at the contract unit price per vertical meter for Item 220.2, Drainage Structure Rebuilt.

Raising of lowered structures shall be paid for at the contract unit price each for Item 220.5, Drainage Structure Remodeled.

Aggregate for providing added volume shall be paid for at the contract unit price per metric ton for Item 402.1, Dense Graded Crushed Stone for Sub-base.

Aggregate to correct gradation deficiencies shall be paid for at the contract unit price per metric ton for Item 403.1, Crushed Stone for Blending.

Calcium Chloride for dust control shall be paid for at the contract unit price per kilogram for Item 440., Calcium Chloride for Roadway Dust Control.

Water for dust control shall be paid for at the contract unit price per 1000 liters for Item 443., Water for Roadway Dust Control.

#### **403.82 Payment Items.**

120.1	Unclassified Excavation	Cubic Meter
150.1	Special Borrow	Cubic Meter
170.	Fine Grading and Compacting - Subgrade Areas	Square Meter
220.	Drainage Structure Adjusted	Each
220.2	Drainage Structure Rebuilt	Vertical Meter
220.5	Drainage Structure Remodeled	Each
402.1	Dense Graded Crushed Stone for Sub-base	Metric Ton
403.	Reclaimed Pavement for Base Course and/or Sub-base	Square Meter
403.1	Crushed Stone for Blending	Metric Ton
440.	Calcium Chloride for Roadway Dust Control	Kilogram
443.	Water for Roadway Dust Control	1000 Liters